

September 21, 2012

Mr. Tom Gainer
Oregon Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

**Subject: Response to DEQ Comments
Additional Storm Water Sampling Work Plan
Port of Portland Terminal 4 Slip 1**

Dear Tom:

This letter provides the Oregon Department of Environmental Quality (DEQ) with a response to the comments received on the Terminal 4 Slip 1 *Additional Storm Water Sampling Work Plan* (Ash Creek, 2012). The comments were provided to the Port of Portland (Port) in a letter from the DEQ dated August 22, 2012. The DEQ comments are repeated (in italics) followed by the Port response.

Section 2.3.1:

- *Please include an analysis of how effective the BMPs are, such as documentation of catch basin cleanouts and sweeping frequency and volume of material removed in relation to time elapsed since last cleaning. This should provide a means for iterative improvement of comprehensive BMP effectiveness.*

Response. Residuals from catch basin cleanout and street sweeping are managed by the Port's Marine Facility Maintenance (MFM) personnel. Waste residuals (e.g., catch-basin cleanout and street sweeping debris) are collected by MFM and consolidated with similar waste streams from other Port facilities and material quantities are not separately documented by facility. These wastes are subsequently profiled for waste characterization to determine appropriate treatment or disposal. Since the residuals are combined with other residuals from other Port facilities, the volume of material removed is not available.

- *Maintenance and cleaning of CBs is noted as annual, but the last referenced date of cleaning was May 2011. This should be updated and discussed as part of the effectiveness analysis above.*

Response. The Port confirmed that the annual cleanout was completed between May and July 2012.

Section 2.3.2: *It appears that the treatment vault current treats about 7% of the total basin stormwater flow. Please provide an estimate of percentage flow treated with the proposed alterations.*

Response. The plans to modify the treatment vault are being conducted to maximize the use and efficiency of the treatment vault in order to reduce the resulting storm water concentrations. The input parameters to perform this type of calculation are complex and not known. However, with the proposed modifications, the treatment vault will treat 100 percent of the first flush of a storm and 100 percent of small storms.

Section 2.4.2: *This section recounts the sequence of stormwater sampling events, but this information doesn't line up with the data and dates presented in the tables presented in September 2009 report. Perhaps a simplified table or bullet list can be prepared for the final SCE report that crosswalks and refines the past presented info.*

Response. Noted. This request will be presented in a future report.

Sections 2.4.3 and 3.0: *DEQ disagrees that PAHs and arsenic concentrations were "within the range of detected concentrations in other Portland Harbor Heavy Industrial sites."*

Response. Noted.

Section 4:

- *Analyses of a limited set of COCs are proposed for both total and dissolved concentrations. The list should be expanded to include the COCs that past data does not make a clear case for being controlled (e.g., metals seemed to be trending upward) and those that are of concern in the river sediment near the discharges (Cd, Cu, Ag, Zn, PAHs, PCBs, pesticides, and dioxin for AOPC 6), unless these can be ruled out by adequate data collected.*

Response. The Port will expand the COC list and proposes the following chemical analyses for PAHs and metals (Al, As, Sb, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, and Zn) for the storm water samples.

The Port is not proposing other chemical analyses per the following lines of evidence.

Dioxins. Dioxins were not historically identified as a Contaminant of Interest (COI) in the upland remedial investigations or the resulting storm water program. In addition, dioxins for AOPC 6 (Terminal 4) are not present at concentrations that exceed agency established risk-based sediment remediation goals for the Portland Harbor Remedial Investigation/Feasibility Study, and will not influence sediment risk management decisions for this AOPC. Therefore, dioxins do not present a potential for sediment recontamination.

Pesticides. Pesticides were part of the 2006-2008 storm water and storm water solids sampling program. As presented in the storm water source control evaluation report (September 2009), the historically detected concentrations of pesticides in storm water were generally low and below SLVs. However, due to the extremely low SLVs for several constituents (i.e., hexachlorobenzene, heptachlor, aldrin, heptachlor epoxide, dieldrin, and DDX compounds), any detections of these compounds were above the SLVs. The concentrations of pesticides detected in storm water solids were low and did not appear to

be related to sources of upland soil or current land activities. Pesticides were not identified in erodible surface soil samples during the Remedial Investigation at Terminal 4 Slip 1 or are associated with current land uses in Basins L and M. Based on the source control analysis and findings in the September 2009 report, DEQ did not request further pesticide chemical analyses for the 2010-2011 storm water sampling program. In addition, pesticides for AOPC 6 (Terminal 4) are not present at concentrations that exceed agency established risk-based sediment remediation goals for the Portland Harbor Remedial Investigation/Feasibility Study, and will not influence sediment risk management decisions for this AOPC. Therefore, pesticides do not present a potential for sediment recontamination.

PCBs. During the 2006-2008 storm water and storm water solids sampling program, Aroclors 1242, 1254, and 1260 were historically detected at low concentrations during one or more sample events in Basins L and M; however, due to the low SLVs for these compounds, a number of the detections only slightly exceeded the SLV. The Aroclor concentrations from Basins L and M collected prior to the storm water conveyance system Source Control Measure (SCM) had a maximum enrichment ratio (maximum concentration divided by SLV) of 2.8, 1.9, and 1.4 for Aroclors 1242, 1254, and 1260, respectively. These concentrations were shown to generally correlate with TSS.

The following observations were made after the SCM based on the follow-up storm sampling in 2010-2011.

1. The TSS concentrations were significantly lower;
 2. None of the detected PCB Aroclor concentrations exceeded the SLVs for Basins L and M; and
 3. The total PCB congener concentrations for Basins L and M decreased (significantly in Basin M). Although the total PCB congeners exceeded the very conservative JSCS SLV for total PCBs (64 pg/L), the detected concentrations were consistent with other Portland Harbor Heavy Industrial Sites (i.e., on the lower, flatter portion of the curve).
- *Since the recontamination analysis is not currently being pursued (and we are not in agreement even if it goes forward as to the use of dissolved concentrations; we recommended total to be more conservative), it's not clear why dissolved analyses are needed. In the event that samples collected are of limited volume, analysis of total concentrations for all COCs should be prioritized and analysis of dissolved constituents could be conducted if there is adequate volume.*

Response. The Port will move forward with only analysis of total concentration samples (i.e., no dissolved analyses).

Section 5.1: *More than two samples may be required, based on DEQ review of the data and analysis presented from the first two events as proposed.*

Response. Noted. The data from the first two events will be tabulated and provided to DEQ for review.

Section 5.2: *Please include a reference to the QA/QC protocols used for previous composite sampling efforts at the Site, including flow data approach and how the sample aliquots will be collected and mixed to create the composite sample. The DEQ understands that flow-weighted sampling will be conducted.*

Response. Please see the attached Standard Operating Procedure.

Please call me at (503) 415-6676 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Kelly Madalinski", with a stylized, flowing script.

Kelly Madalinski
Environmental Project Manager

Reference:

Ash Creek, 2012. *Additional Storm Water Sampling Work Plan*, Terminal 4 Slip 1 Upland Facility. August 1, 2012.

c: Kristine Koch, EPA
Rich Muza, EPA
Sean Sheldrake, EPA
Lance Peterson, CDM
Emily Willits, Cargill Inc.
Tom Flynn, Cargill Inc.
Bill Ford, Lathrop & Gage
Suzanne Barthelmess, Port
David Breen, Port
Jessica Hamilton, Port
Michael Pickering, Ash Creek Associates
Mark Lewis, Formation Environmental
LWP File

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods used for obtaining automated composite water samples from storm drains, outfalls, flumes or surface waters for physical and/or chemical analysis. This SOP does not include collection of grab samples.

Bulk storm water samples will be collected as composite samples, which comprise a number of discrete individual samples of specific volumes taken at flow-weighted or time-weighted intervals. An automatic composite sampler will be set up with an area velocity flow meter that activates the sampling when there is flow in the pipe. This procedure is applicable during all Ash Creek Associates automated composite water sampling activities.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Automated sampler (Teledyne-Isco Model 6712 or similar) equipped with pre-cleaned 1-gallon glass collection vessels, a Teflon® screen, a Teflon® sampling tube, and an area/velocity (AV) type flow meter.
- RV/marine deep cycle 12 volt batteries.
- Stainless steel mounting brackets for flow sensor and sampling tube
- Wooden sampler cover (where necessary – varies by site)
- Mounting hardware to hang sampler in manhole (where necessary – varies by site)
- Field documentation materials (including flashlight)
- Decontamination materials
- Personal protective equipment (as required by Health and Safety Plan)

3. METHODOLOGY

Project-specific requirements will generally dictate the preferred type of sampling equipment used at a particular site. The following parameters should be considered: accessibility of sampling point, sampling depth, and flow rate. Analytical testing requirements will indicate sample volume requirements that also will influence the selection of the appropriate type of sampling method. The project sampling plan should define the specific requirements for collection of outfall water samples at a particular site.

Installation and Maintenance of Sampler

- Program each sampler with the flow velocity for that specific pipe corresponding to the target rainfall event intensity. The Rational Method, in combination with Manning's equation and pipe geometry will be used to estimate flow velocity for the initial flow-weighting programming for the composite samplers. The Rational Method is a widely used method for estimating runoff of small drainage basins.¹ The Manning equation² and pipe geometry will be used to estimate the flow level and velocity expected in

¹ The rational method equation is: $Q = kCiA$ where: Q – runoff flow; k – conversion constant; C - dimensionless runoff coefficient; i - rainfall intensity and A - catchment area.

² The Manning Equation was developed for uniform steady state flow in an open channel and is: $V = \frac{k}{n} R_h^{\frac{2}{3}} \cdot S^{\frac{1}{2}}$ where:

V is the cross-sectional average velocity; k is a conversion constant n is the Manning coefficient of roughness; R_h is the hydraulic radius; S is the slope of the water surface. The discharge formula, $Q = AV$, can be used to manipulate Manning's equation to compute flow knowing limiting or actual flow velocity.

the storm water conveyance system within each basin based on the estimated runoff from a criteria storm.

- Program each sampler with the pipe diameter and the length of the suction sample line. Calibrate each sampler for water level readings.
- Program each sampler to fill individual 1-gallon glass collection vessels one at a time.
- Make sure that the sampler is above any high water level within the pipe or in a ground surface installation.
- Place the intake tubing with at least 2 inches of depth or greater for the intake. Construct a deeper pool using sandbags, weirs or flumes (as necessary). Use an anchor system or anchors to secure the tubing.
- All work requiring confined space entry will be performed by subcontractors with the necessary training.
- The glass collection vessels, screen, suction line, and pump tube will be decontaminated prior to installation. It is not anticipated that screens and intakes tubes will be removed for cleaning between sampling events. The sampler will be programmed to purge the intake tubes and silicon pump tubing several times before and after each stormwater sample is collected. Inspect tubing before each event. If algae is growing in the intake tube, debris is blocking the tube, or any other gross contamination issues may exist, contaminated screens and intake tubes will be replaced with decontaminated screens and intake tubes decontaminated or replaced.

Collection of Samples

- Record weather conditions at the time of sampling and last known rain fall event(s). Record and describe site conditions upon arrival and during sampling.
- Collect samples using the "Clean Hands/Dirty Hands" sampling technique. Operations involving direct contact with the sample bottle, sample bottle lid, sample suction tubing, and the transfer of the sample from the sample collection device to the sample bottle are handled by "clean hands". "Dirty hands" is responsible for preparation of the sampler (except the sample container itself), operation of any machinery, and for all activities that do not involve handling items that have direct contact with the sample.
- Cap the glass collection vessels and remove from the sampler.
- Submit samples to the laboratory under chain-of-custody protocols for compositing, filtration (as necessary), and analysis.